

The Canadian Entomologist.

VOL. XXXIX.

LONDON, OCTOBER, 1907.

No. 10.

A LIST OF PERLIDÆ FROM BRITISH COLUMBIA AND ALBERTA.

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Recently Prof. Raymond Osburn, of Columbia University, New York, turned over to me a large collection of Perlidæ made in British Columbia and Alberta. He spent two summers in this region, but collected chiefly in British Columbia. As the lot contains at least a fair proportion of the Perlid fauna of that region, I have made it the basis of a paper. I have also received some Stoneflies of this region from the Rev. G. W. Taylor and Prof. Harvey. In 1903 Mr. R. P. Currie (with Dr. Dyar and Mr. Caudell) spent a season at Kaslo, B. C. He has kindly permitted me to examine his catch of Perlidæ (about 100 specimens), which is now in the National Museum; and I have added his localities to the species in this list. All uncredited localities are from the collection of Prof. Osburn.

As most of the genera are readily separated, I have prepared a key to enable the collector to recognize them. The identification of species is a more difficult matter, and must be made, at present, by a specialist. Undoubtedly there are other species to be found in this region, but the genera are probably all represented in the list.

Perlidæ, like Lepidoptera, should be spread, at least partly, before identification. The essential specific characters are in the genitalia, but the size and markings of head and pronotum are quite constant in each form.

Five of the species are new, the most interesting being the new *Pteronarcys*.

KEY TO GENERA.

1. In the hind tarsi the apical joint is at least a little longer than the two other joints together; anal setæ always distinct; the anal cell of fore wings usually gives off at least two veins from below. 2.
In the hind tarsi the apical joint is at least a little shorter than the two other joints taken together; setæ often absent; the anal cell of fore wings never gives off but one vein from below. 10.
2. Anterior coxæ approximate; a series of cross-veins in anal region of fore wings. (Pteronarcini) *Pteronarcys*.
Anterior coxæ widely separate; rarely a series of cross-veins in anal region of fore wings. (Perlini) 3.

3. Many cross-veins between radius and radial sector, as well as between branches of radial sector *Perlodes*.
Rarely more than one cross-vein between radius and radial sector, and not many between branches of radial sector 4.
4. Several cross-veins in middle part of fore wing, between branches of radial sector *Acroncuria*.
Few, if any, cross-veins in middle part of fore wing, between branches of the radial sector 5.
5. Ocellar triangle more than twice as broad as long; usually one cross-vein between radius and radial sector near end of latter; a dark spot near pterostigma *Isogenus*.
Ocellar triangle not twice as broad as long; only abnormally a cross-vein between radius and radial sector near tip of latter 6.
6. But two ocelli, and setæ very short; the pronotum broader than head *Peltoperla*.
With three ocelli 7.
7. From the anal cell of fore wings there extend below two simple veins, or one simple and one forked 8.
From the anal cell of fore wings there extends below but one vein, which soon forks 9.
8. Hind wings with but two cross-veins in the cubital area, one near base, one near tip; small greenish or yellowish species *Isoperla*.
Hind wings with a series of cross-veins in the cubital area; radial sector of fore wings usually twice forked *Perla*.
9. A series of cross-veins in cubital area of hind wings; radial sector of fore wings forked twice *Paraperla*.
No series of cross-veins in cubital area of hind wings, only one near base, and one near tip; small greenish or yellowish species *Alloperla*.
10. Anal setæ obscure or absent; one branched vein from anal cell of fore wings; a series of cross-veins in median and cubital areas of fore wings (Nemourini) 11.
Anal setæ distinct; one simple vein from anal cell of fore wings; no series of cross-veins in median and cubital areas of fore wings (Capnini) 14.
11. Second joint of tarsi subequal to first; no oblique cross-vein beyond end of subcosta *Teniopteryx*.
Second joint of tarsi much shorter than first 12.

12. An oblique cross-vein beyond end of the subcosta ; wings not involute *Nemoura*.
 No oblique cross-vein beyond end of subcosta 13.
13. Wings involute ; pronotum as broad as long *Leuctra*.
 Wings not involute ; pronotum longer than broad *Perlomyia*.
14. The space beyond discal cell longer than discal cell *Arsapnia*.
 The space beyond discal cell shorter than the discal cell . . . *Capnia*.

LIST OF SPECIES.

Pteronarcys Californica, Newport. — A female from Vancouver (Harvey).

Pteronarcys princeps, n. sp.—Head dark brown or black above, pale around ocelli ; antennæ blackish-brown ; pronotum black ; a reddish-yellow spot in middle of front and hind margin, not distinctly connected ; rest of thorax blackish ; abdomen paler brown, blackish on pleura, base of venter paler. Legs dull blackish-brown ; wings rather smoky to quite dark, the apical third from just before the pterostigma outward is more infuscated, and there is a more distinct black cloud below the pterostigma ; venation blackish-brown ; in the male the basal part of the abdomen is rather orange. The head is much narrowed in front ; the pronotum has all the angles acute, and the sides are slightly rugose ; the male tip of abdomen is much like *Pt. Californica*, but the scar each side is larger, and the area that separates them is narrower at tip than in that species. The ventral plate of the female (Fig. 16) has two very large hairy processes fully three times as long as in *Pt.*

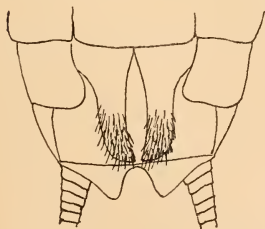


FIG. 16.—Ventral plate of female of *Pteronarcys princeps*.

Californica.

Expanse, 70–75 mm.

One pair from Mission, B. C., April (Harvey).

Perlodes signata, Hagen.—Vancouver, 12th April (Harvey).

Perlodes irregularis, Banks.—Glacier, B. C., 21st August, and Laggan, Alta., 22nd July and 23rd August ; Kaslo, B. C., June (Currie, Dyar, Caudell) ; Ainsworth, 11th July (Currie).

Isogenus frontalis, Newman.—Vancouver, 19th May (Harvey) ; Kokanee Mt., B. C., 10th August, 9,000 ft., on snow (Currie).

Acroneuria Quebecensis, Provancher.—A pair from Laggan, Alberta, 22nd July.

The female has a notched ventral plate like a specimen in the Hagen coll. at the M. C. Z., labelled *A. Quebecensis*. It is a narrower and darker species than *A. pacifica*.

Acroneuria pacifica, Banks.—Nicolum River, Hope, B. C., 13th July (Harvey); Vancouver (Harvey).

Perla sabulosa, Banks.—Port Renfrew, B. C., 3rd July.

Perla ebria, Hagen.—Vancouver (Harvey); Glacier, B. C., 22nd August; Wellington, B. C., 9th August (Taylor); Laggan, Alta., 22nd July; Banff Sp., Alta., 16th August (Currie).

Paraperla frontalis, Banks.—Laggan, 23rd August.

Isoperla decolorata, Walker.—Described from Great Bear Lake. I have not seen it from British Columbia, but it occurs in Alaska and in Eastern Canada.

Peltoperla brevis, n. sp.—Head pale, with a large, ill-defined black cloud on the middle, not extending to the mouth; antennæ brown; pronotum brown, its margin paler; thorax dark brown or black; abdomen brown; legs pale yellowish; wings subhyaline, venation brown, costal veins yellowish. Structure similar to *P. arcuata*. Head broad, bent downward, two ocelli, about as close to each other as to eyes; antennæ slender, about as long as front legs, the joints rather nodiform; pronotum very broad, slightly angulate behind on the middle, its sides straight, surface quite strongly rugose; abdomen broad and short, setæ very short, scarcely one-half as long as width of abdomen; anal plate of female (Fig. 17) large, notched at middle behind. Wings rather short and broad, many central cross-veins, radial sector forked once beyond anastomosis; anal cell with two widely-separated branches behind.

Expanse, 18–20 mm.

From Glacier, 21st August, and Port Renfrew, 3rd July.

Alloperla Coloradensis, Banks. — Port Renfrew, 2nd July; Glacier, B. C., 20th July and 21st August; Laggan, Alta., 23rd August; Kaslo, B. C., 18th June (Currie); Ainsworth, B. C., 11th July (Currie); Kokanee Mt., B. C., 10th August, 8,000 ft. (Currie).

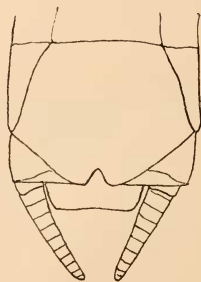


FIG. 17.—Ventral plate of female, *Peltoperla brevis*.

Alloperla imbecilla, Say.—Port Renfrew, B. C., 3rd July; Glacier, B. C., 20th July and 21st August; Bear Lake, B. C., 20th July (Currie); Ainsworth, 11th July (Currie).

Alloperla pacifica, Banks.—Port Renfrew, B. C., 3rd July.

Alloperla borealis, Banks.—Port Renfrew, 29th June; Banff, Alta., 17th June; Laggan, Alta., 22nd July and 23rd August.

Teniopteryx pacifica, Banks.—Banff, Alta., 17th June; Kaslo, B. C., 18th June (Currie).

Teniopteryx occidentalis, Banks.—Kaslo, B. C., 18th June (Currie). One specimen, the second I have seen.

Nemoura cinctipes, Banks.—Port Renfrew, 3rd July; Goldstream, B. C. (E. A. Anderson); Wellington, B. C., 29th February (Taylor); Laggan, Alta., 23rd July; Kaslo, B. C., 18th, 30th June, 16th August (Currie, Caudell).

Nemoura depressa, Banks.—Laggan, Alta., 21st August; Bear Lake, B. C., 20th July (Currie).

Pelomyia collaris, Banks.—Wellington, B. C., 26th April (Taylor).

Arsapnia grandis, n. sp.—Black; antennæ brownish; legs brownish; wings brownish, sometimes darker on the anastomosis; venation dark brown. Posterior ocelli about twice as far apart as from the eyes; pronotum about as long as broad, narrowed behind, slightly rugose each side; abdomen elongate, setæ nearly as long as the abdomen, their joints (beyond basal ones) very long and slender; hind tibiæ scarcely reaching to tip of abdomen. Wings large and elongate, three to seven costal cross-veins, also one beyond end of subcosta, apical cells longer than discal cell; in the median and cubital areas there is but one cross-vein, which is continuous.

Expanse, 22–25 mm.

Specimens from Wellington, February; Vancouver, April; and Banff, Alberta, 17th June.

Arsapnia decepta, Banks.—Banff, Alta., 17th June.

Leuctra occidentalis, n. sp.—Black; antennæ brownish; legs pale brown; dorsum of abdomen reddish; wings smoky, veins brown, costal area at extreme base brown. Head with some fine white hairs; pronotum broader than long, rather narrowed behind, its surface slightly rugose, with a broad median depression containing a median ridge. Wings rather short and broad, the radial sector forks before the upper

cross-vein, but beyond the lower cross-veins, about six cross-veins in the median series, and in the cubital series there are two, rarely three, cross-veins beyond the last of the median series; in the hind wings the radial sector forks as in the fore wings, and there are five cross-veins in an irregular transverse row. The apical claw-like joint of the male claspers is jet black; before them there is an erect, slightly curved median tooth. (Figs. 18, 19.)

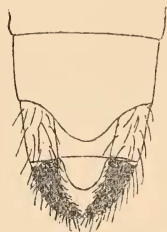


FIG. 18.—Ventral view of male genitalia, *Leuctra occidentalis*.

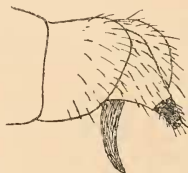


FIG. 19.—Side view of male genitalia, *L. occidentalis*.

Expanse, 12–14 mm.

From Laggan, Alta., 23rd August; Ainsworth, 11th July (Currie); Bear Lake, 29th July (Currie).

Leuctra augustus, n. sp.—Black; head with some short, fine white hairs; antennæ brownish-black; abdomen, beyond base, rather reddish; legs yellowish-brown, hind femora darker towards tip; wings rather fumose, venation yellowish-brown. Pronotum fully twice as long as broad, slightly rugose each side, a median depressed area with a central ridge; abdomen slender; legs very long, especially the hind pair, being plainly longer than the entire body. Wings very slender, reaching fully one-half their length beyond the tip of the abdomen, the radial sector forks beyond the lower cross-vein, and before the upper one, about six cross-veins in the median series, and in the cubital series there are three or even four cross-veins beyond the last of the median series.

Expanse, 18 mm.

From Port Renfrew, 10th August.